



Center for the Advancement of Sustainability Innovations



US Army Corps
of Engineers



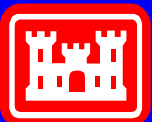
William D. Goran, Center Director

Website: <https://casi.erdcl.usace.army.mil/>

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Outline

- CASI coordination forum
- CASI technical focus areas
- Featured topics/focus areas
 - Sustainable energy solutions
 - Sustainable forward operations
 - Sustainable design innovation
 - Water resources for sustainable bases
 - Ecosystem services related to military lands
 - Climate change impacts, policies, adaptations
- Upcoming events and forums involving CASI



Center for the Advancement of Sustainability Innovations - CASI

- Virtual multi-site ERDC capability, created in 2006, with a “hub” at CERL but with many partnerships
- Supporting the Army strategy for sustainability by providing technical support, expertise and innovative capabilities to advance sustainable practices across Corps, Army and Defense operations
- Performing sustainability assessments and audits, facility planning and design assistance, energy conservation and renewable sources analysis
- Assisting Defense and Army organizations to understand material and system consequences of operations and acquisitions



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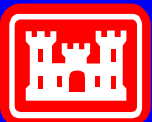
Sustain the Mission, Secure the Future

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CASI Coordination & Input

CASI works with many formal and informal groups and forums:

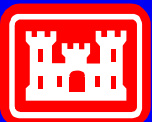
- Inter-Agency Climate Change Impacts Working Group
- Army Sustainability Council
- AEPI Foresight Consultative Team
- SERDP Sustainable Infrastructure Technology Teams
- Corps of Engineers Sustainability Council
- Corps of Engineers Strategic Planning and Actions for Change Forums
- OSD Sustainable Ranges Program Forums
- Army Research Office Environmental Sciences Program
- NDCEE Technical Advisory Forums



CASI Technology Focus Areas

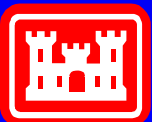
- Sustainability Approaches, Education and Knowledge Management (Michelle Hanson, ERDC-CERL)
 - Sustainable Regional Planning (Jim Westervelt, ERDC-CERL)
 - Sustainable Materials Solutions (Vicki Van Blaricum, ERDC-CERL)
-

- Sustainable Energy Solutions (Tom Hartranft, ERDC-CERL)
- Sustainable Forward Military Operations (Deb Curtin, ERDC-CERL)
- Sustainable Facilities and Infrastructure (Rich Schneider, ERDC-CERL)
- Sustainable Water Resources (Kathleen White, ERDC-CRREL)
- Ecosystem Services and Natural Capital (Elizabeth Keysar, Concurrent Technologies Corporation)
- Climate Change Impacts (Tim Hayden, ERDC-CERL, and Sam Higuchi, NASA)



CASI Technical Focus Areas

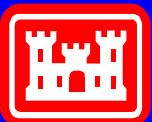
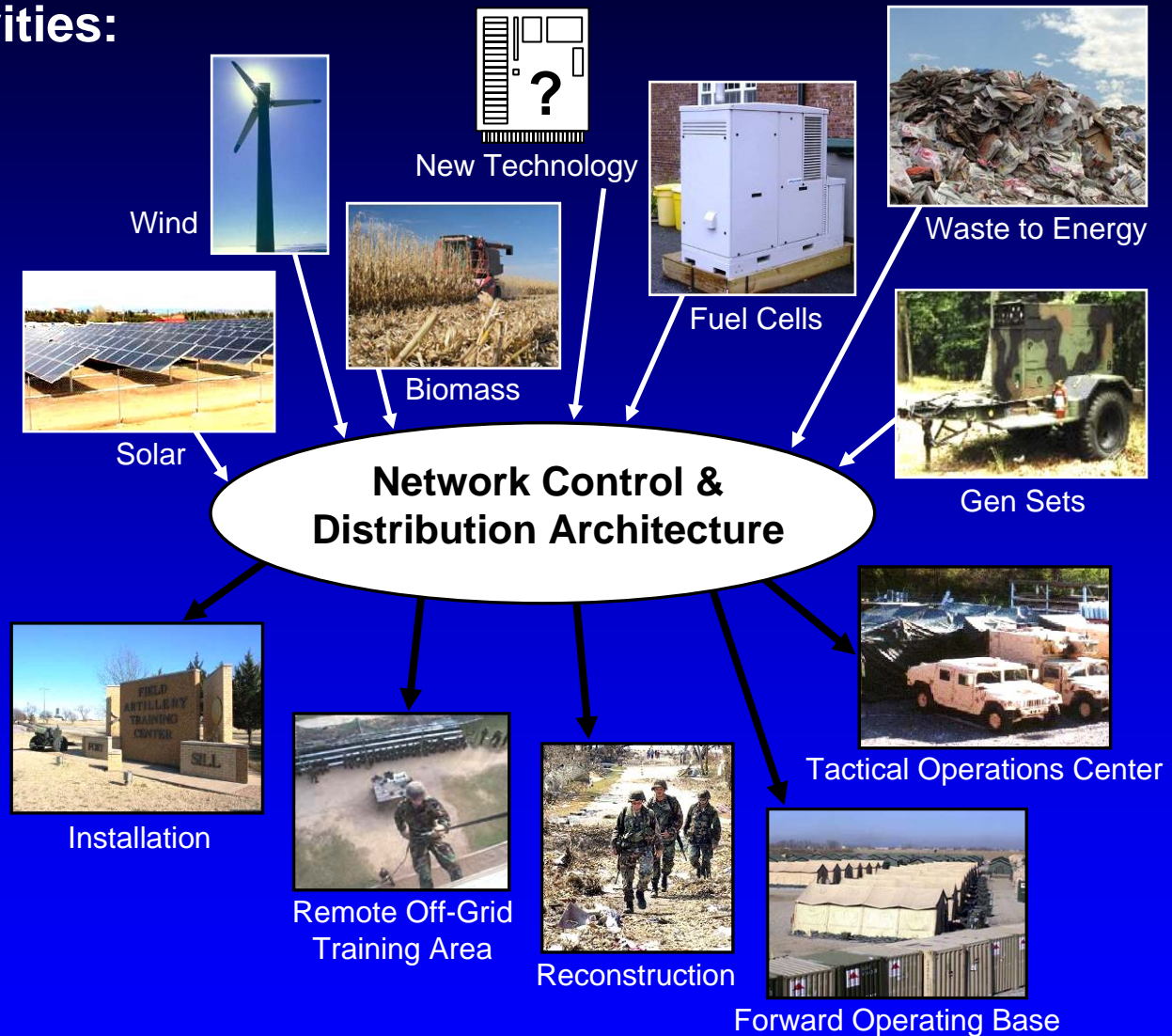
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- Ecosystem Services and Natural Capital (Elisabeth Keysar, Concurrent Technologies Corporation)
- Sustainable Forward Military Operations (Deb Curtin, ERDC-CERL)
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Sustainable Energy Solutions

Microgrid Related Activities:

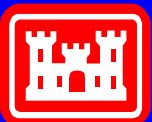
- SERDP Statement of Need (ERDC Technical Monitor on Virginia Tech FY08 microgrid design project)
- Ft. Sill microgrid design (with Sandia National Lab) and Ft. Bragg generator integration project
- Microgrids for full spectrum military operations (EM Magazine article, October 2007)
- Advising Iraqi basecamp – moving towards currently potential solutions



Sustainable Forward Military Operations

CASI Engagements Related to Forward Operations

- **Sustainable CONOPS** - with sponsorship of Army Environmental Policy Institute, developing framework for CONOPS science and technology investments
- Working with SERDP & ESTCP, ARO, RDECOM and ERDC to establish **basing systems science** thrust (e.g. forward basing as “system” within Army/Defense systems of systems)
- Supporting TRADOC’s Basecamp Integrated Capabilities Development Team (ICDT) to define capability needs for forward bases



**TRADOC Integrated
Capabilities Development
Team (ICDT)**

Formal Process

**Technology Shortfall
Analysis Method**

S&T Roadmap

**Sustainable
CONOPS
Project**

Provides Framework

- To connect existing efforts
- To coordinate expertise
- For roadmap strategies

Informal Responses

Kitchen & Solid

Solar
Tents

Ad Hoc Projects

Zero Footprint
Basecamps

Package
Reduction

Microgrid
Design

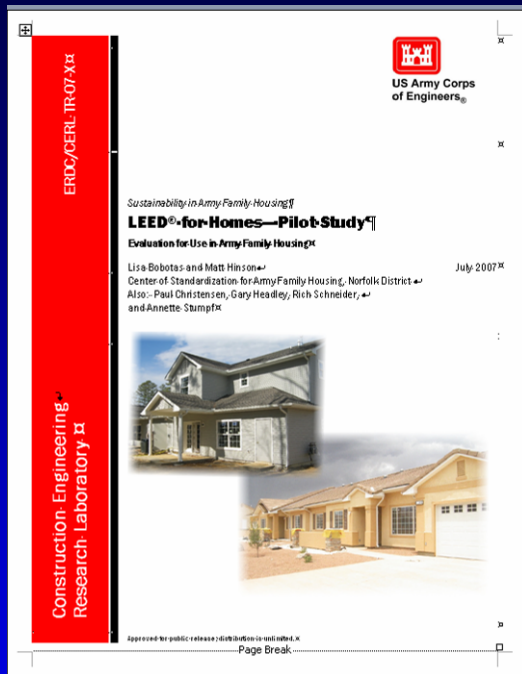
**New S&T
Programs**

Forward Basing Problems

**Right timing
Right actions**



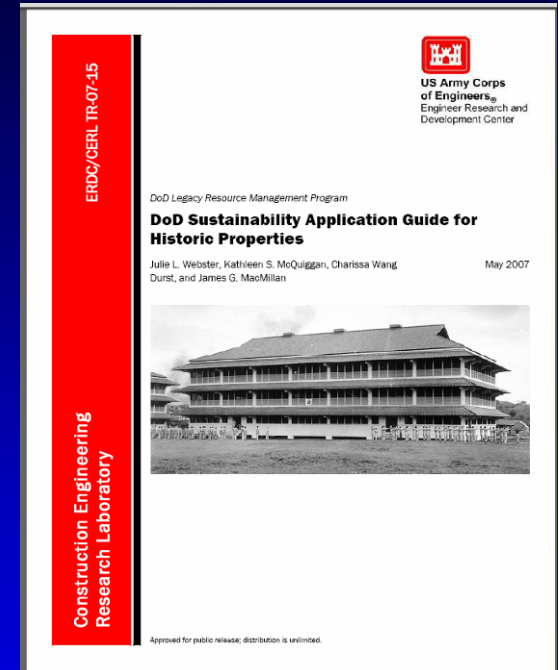
Sustainable Facilities & Infrastructure



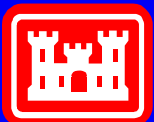
LEED for Homes



Sustainable Design for Building Complexes & Watersheds



Sustainable Historic Properties



Providing evaluations, guidance, training and demonstrations related to implementation of sustainable design approaches

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Sustainable Water Resources

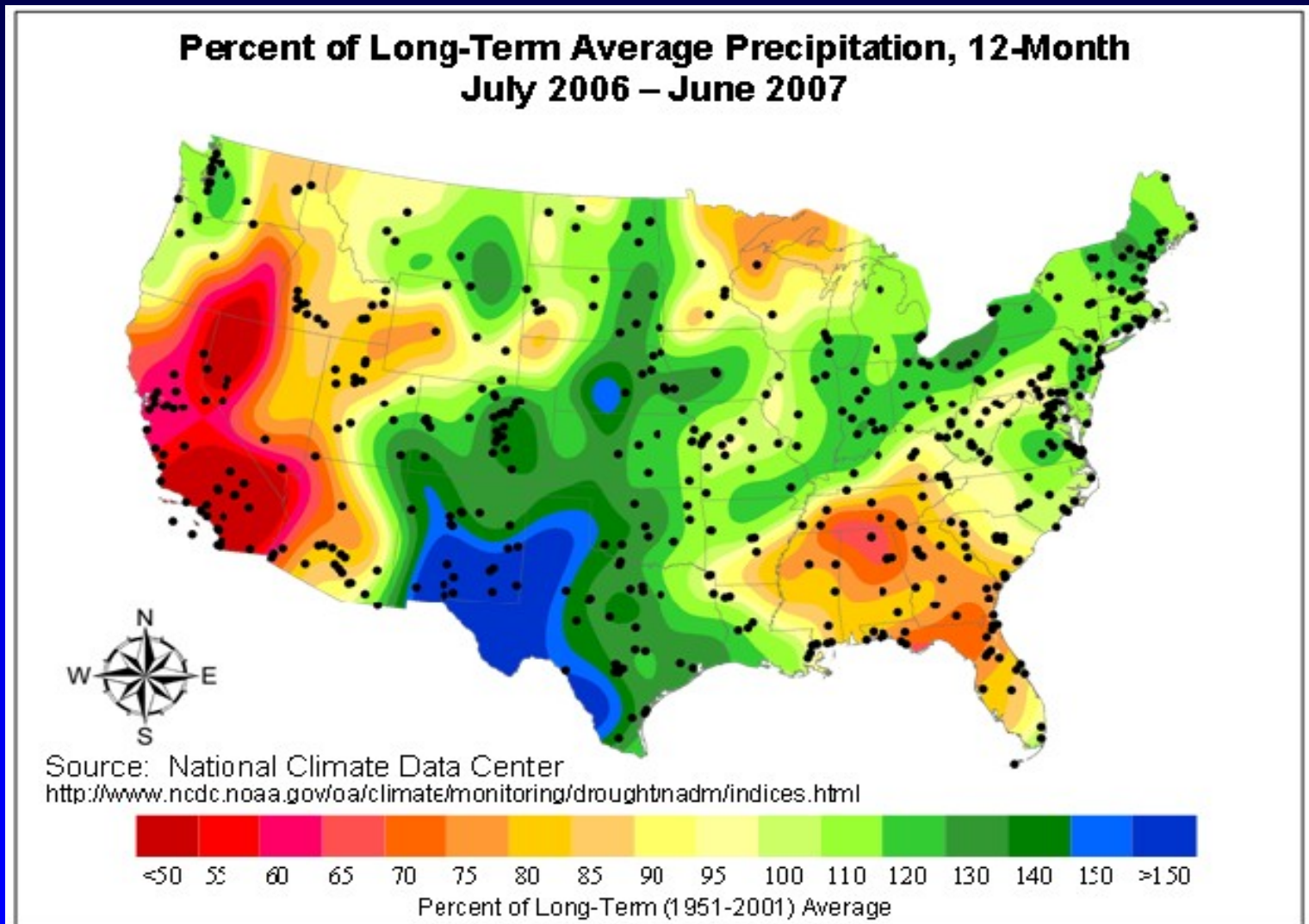
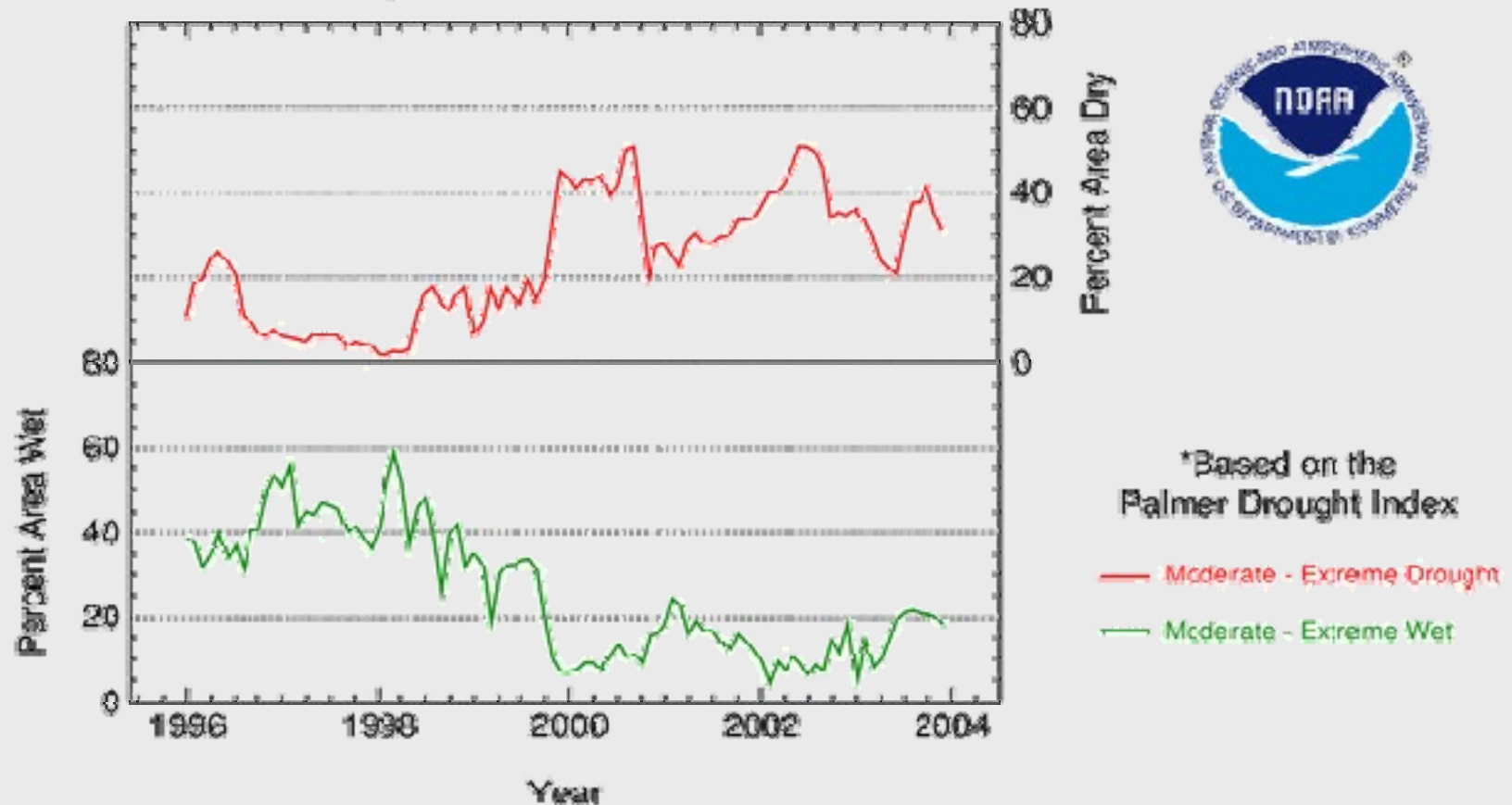


FIGURE 6. Recent precipitation conditions for the CONUS military bases

Drying Up

U.S. Percentage Area Wet or Dry
January 1996 - December 2003



National Climatic Data Center / NESDIS / NOAA

Integrated Water Cycle Systems Approach

1. Identify site characteristics and interactions with the built environment

2. Conduct a site water balance

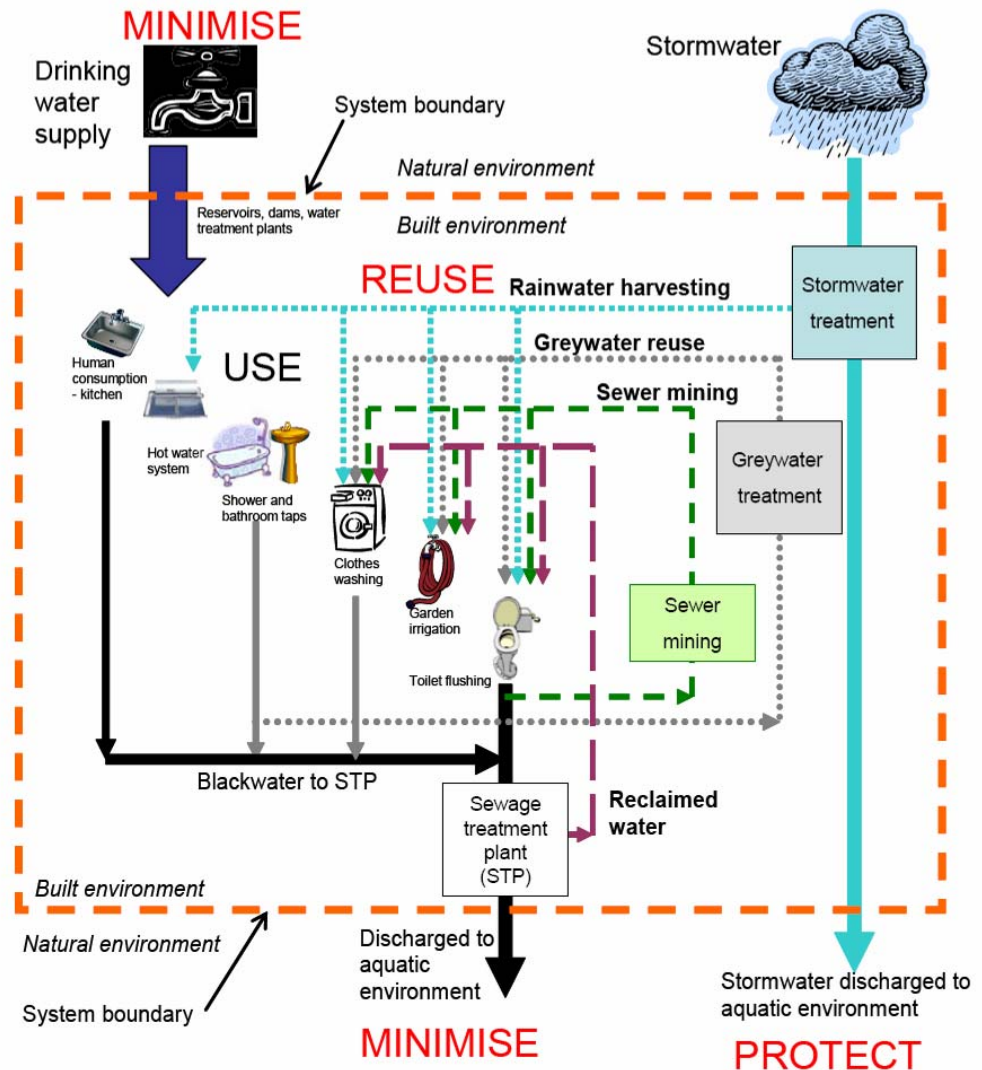
3. Identify water reuse treatment options

4. Social and human health considerations

5. Evaluate the impact on natural environment

6. Life cycle costing evaluation

7. Evaluation of water reuse options



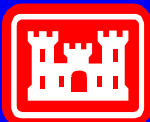
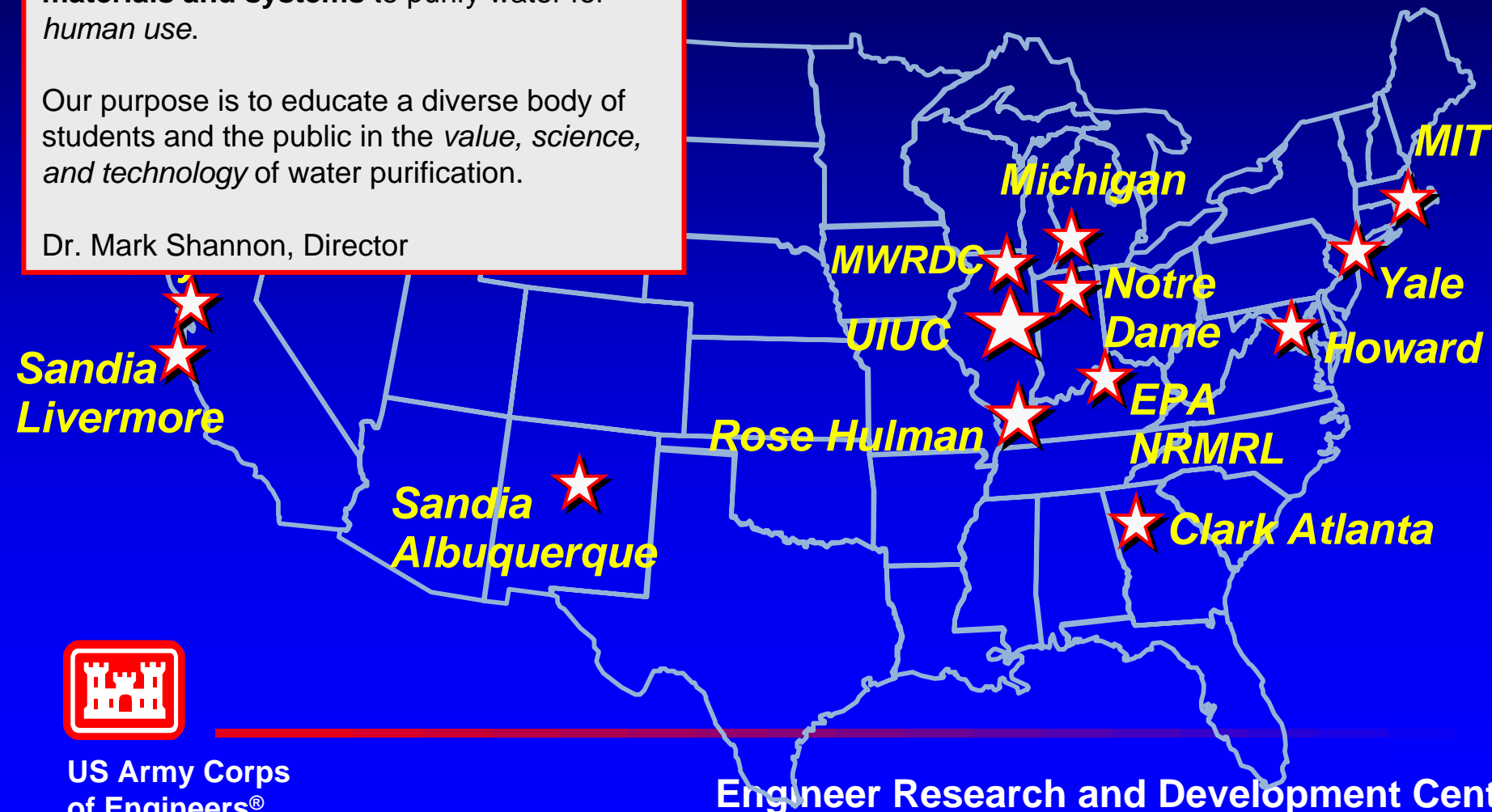
WaterCAMPWS

- Science and Technology Center Awarded late 2002, \$4 m/yr from NSF, \$400k Illinois
- 9 universities, 3 partners, ~120 students, ~50 faculty

Our mission is to develop **revolutionary new materials and systems** to purify water for *human use*.

Our purpose is to educate a diverse body of students and the public in the *value, science, and technology* of water purification.

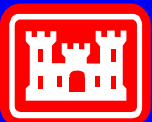
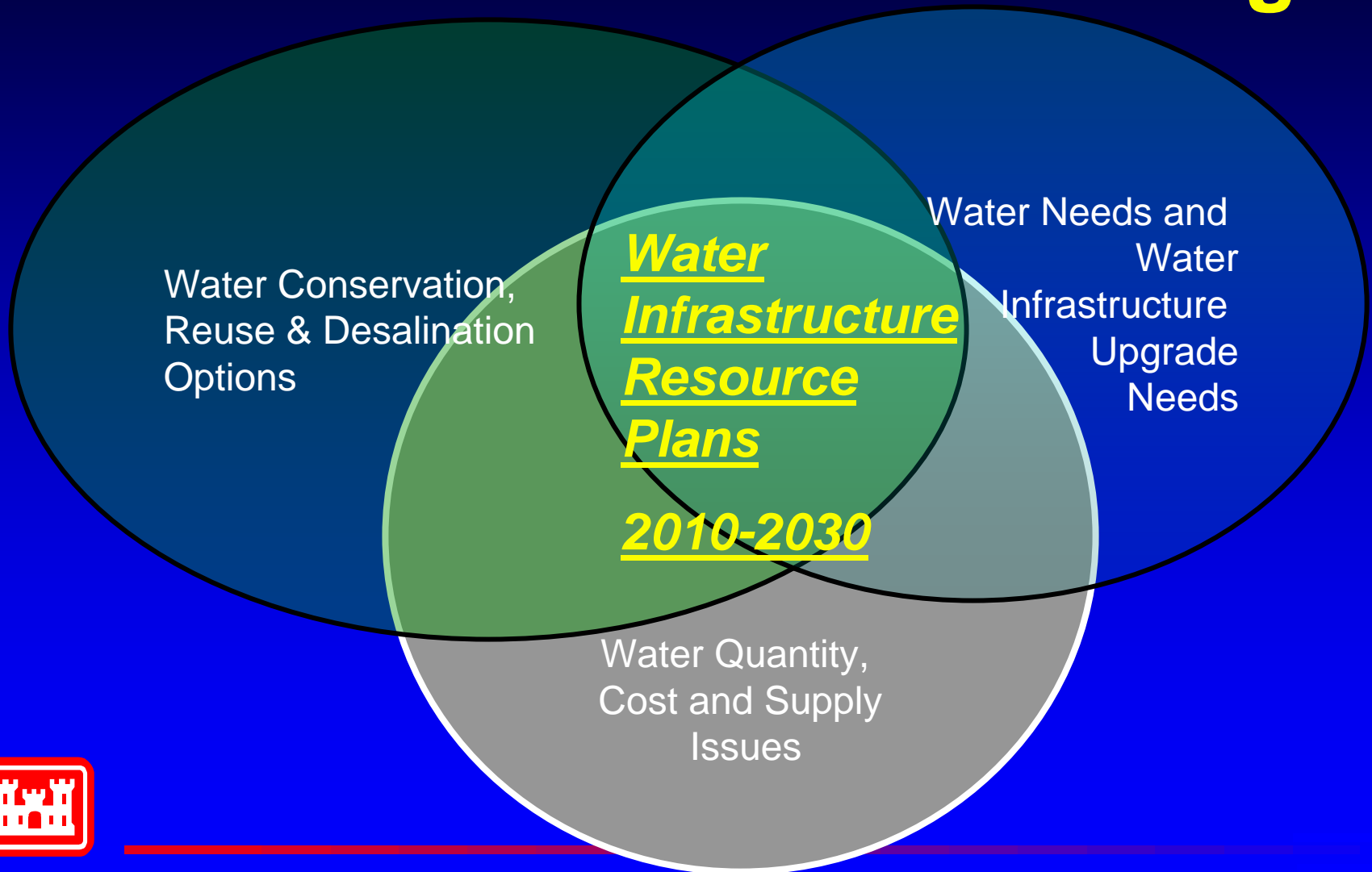
Dr. Mark Shannon, Director



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Water Infrastructure Planning



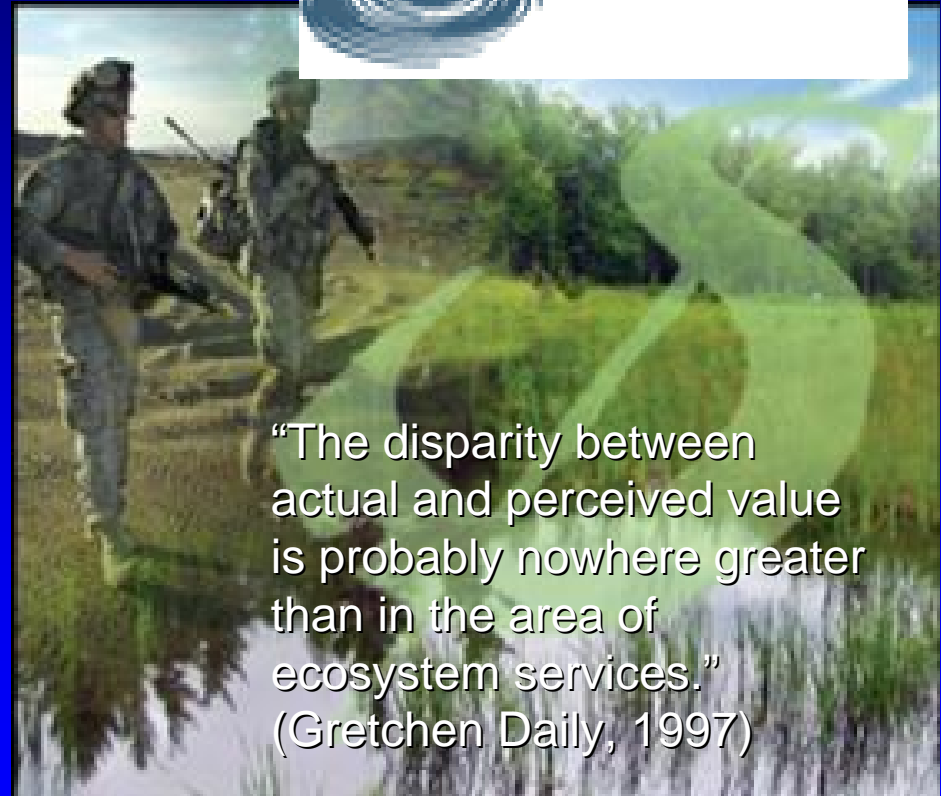
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Ecosystem Service Valuation

CASI Related Activities

- Collaboration with AEPI on Foresight bulletin March 2007 and JSEM presentations May 2007
- Collaboration with Concurrent Technologies on ERDC Special Report on current & potential military land actions related to ecosystem services (Feb 2008)
- Collaboration with The Nature Conservancy and SERDP - April 2008 workshop, to be hosted at Eglin Air Force Base



“The disparity between actual and perceived value is probably nowhere greater than in the area of ecosystem services.”
(Gretchen Daily, 1997)



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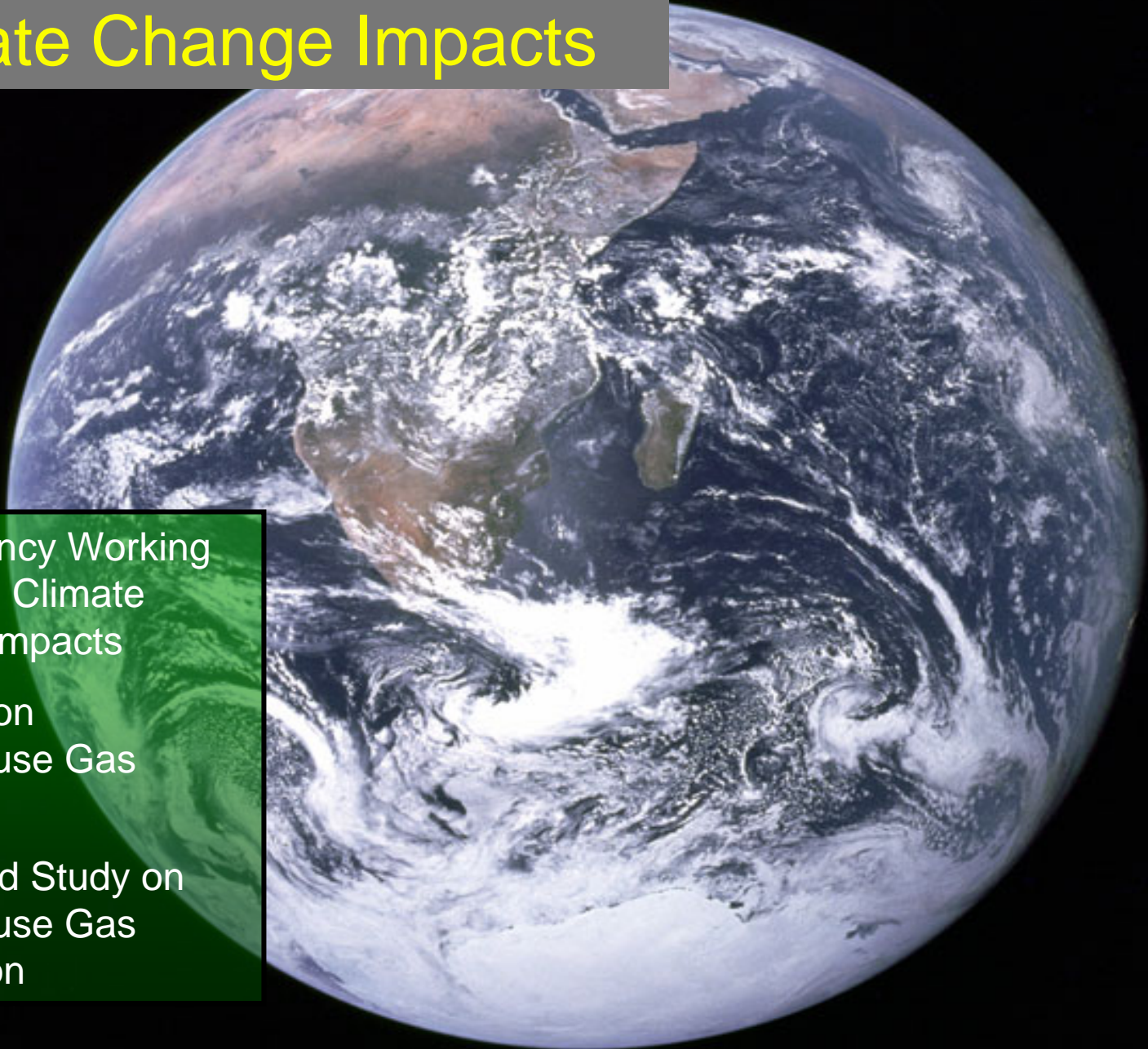
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Climate Change Impacts

- Interagency Working Group on Climate Change Impacts

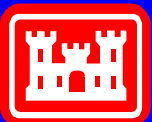
- Ft. Carson Greenhouse Gas Study

- Proposed Study on Greenhouse Gas Regulation



Upcoming Forums Involving CASI

- January 30th, 2008 Washington DC : Climate change impact interagency working group – NASA Host
- April 8-9th, 2008 Munich, Germany : 16th General meeting, US/GE environmental technology data exchange agreement
- April 15-17th, 2008 Eglin AFB, Florida : Ecosystem services workshop, (The Nature Conservancy, SERDP)
- May 2008 JSEM, Denver, CO:
 - Sustainability Design (Army Corps of Engineers, ACSIM, IMCOM)
 - Water Supply (AEPI, ERDC, IMCOM, Booz Allen, Marstel Day, CHPPM, University of Illinois)
- June 2008 Champaign, IL: Water technology options for defense operations, (University of Illinois Water CAMPWS , ERDC, SERDP)



Questions?

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